ROINN NA MARA

THE SEA-TROUT YEAR 1986

by

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Fishery Leaflet 140 1987

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Available indicators describe 1986 as a poor year for sea trout catches, the reason for this being depleted stocks. A brief growing season contributed to a poor recruitment; runs out of Burrishoole were low and the Waterville catch contained few post-smolt (finnock). While, on the commercial licence returns submitted to the Department, the salmon catch held up to the levels reported in 1985, draft net caught sea trout were fewer. Reports from Fishery Boards suggest catches were about a quarter lower in 1986 than in the previous year. Their reports are corroborated by the rod licence returns which indicate there was a slight rise in the average weight of sea trout caught, consistent with a reduced finnock run, and that there was a reduced yield per rod day.

Fisheries Boards' Figures

The estimates of total catch were requested on a Fishery District basis at the end of the 1986 season from the Regional Fisheries Boards and such information as had been received by 30 May is given in Table 1. As is generally the case statistics are not available from every fishery district. In keeping with previous years the figures should be interpreted as a single observer's estimate of the numbers of fish captured in the area with which he has greatest familiarity. Although the returns should be regarded as indications of catch rather than accurate totals they should be comparable with similar data collected in previous years. Official figures for total sea trout catches will be given in Roinn na Mara's annual Fisheries Report and will include data from other sources.

In 1986 the sea trout catch declined from the 1985 total by 26.5%. This was in spite of the summer months being wet, ideal angling weather.

Earlier reports in this series contain information which can be compared over an eight year period (Fig. 1) and this suggests great stability in the landings, despite an interpreted reduction in stocks.

Rod and line returns

Returns from licensed anglers, received by early March 1987, numbered 795. They are analysed in Table 2, similar criteria from the 1985 season having been set out alongside for comparison. Weights are expressed in pounds, this being the unit most used and best appreciated by fishermen; elsewhere in this leaflet metric units are employed.

In 1986 there was a slight reduction in relative angling effort directed towards sea trout; otherwise the results support the generally established pattern of approximately one in three licensed rod days going to sea trout, the remainder to salmon.

The mean weight of an individual sea trout caught on rod and line in 1986 was a slight improvement over the previous year. An increase in average sea trout weight might indicate a reduction in recruitment and, hence, a lower proportion of post-smolt, large numbers of which tend to depress the average weight of trout captured. More will be said of this when population structures are considered.

In keeping with the reported reduction in catches per Fishery District, the average weight of sea trout per rod day was also lower in 1986 than in the previous year.

A more detailed consideration of the rod angling licences, analysed according to type (Table 3) clarifies some of the foregoing observations. Compared with 1985, 1986 was apparently a better year for salmon and past experience suggests that in such conditions fishing effort is drawn away from the smaller species. In contrast, the sea trout yield to every category of licence was lower in 1986, disproportionately low in relation to the slight reduction in angling effort suggested by the returns. A poor angling season may have a genuine basis in depleted stock numbers.

Commercial licence returns

Only 64 drift net licence returns and 43 returns from draft nets were made from three districts by the end of May 1987. Their contents are summarised in Table 4 along with returns from the previous five years. Some caution must be exercised in interpreting the data because national coverage is poor (there were no returns from the Northern, Northwestern or Southwestern Regions in 1986).

What data there are suggest the salmonid yield from drift nets was almost identical to 1985. Salmon landings from draft nets were also similar to those in 1985 but the sea trout contribution by these regions was very poor, similar to the catch in 1981.

Specimen sea trout

In 1986 twelve specimen sea trout were accepted by the Irish Specimen Fish Committee, an increase of one over the previous year's total. As is usually the case, the majority of these fish come from Lough Currane. Their large number in 1986 was again contrary to expectation. Attempts to explain the greater than expected numbers of sea trout in 1985 and 1986 considered rainfall and possibly low exploitation rates in earlier years. Further data on specimen fish numbers may clarify matters. Because of the decline in length of agricultural growing season, the range of climatic variation in which the relationship between specimen trout numbers and growing conditions were established, has been greatly distorted in recent years.

POPULATION STRUCTURES IN 1986

Growing conditions

Information supplied by the Ag Met Section of the Meteorological Service provides an indication of grass growing conditions, believed to be influential in sea trout production also. According to the criterion which has been used in this series of leaflets, there were 197 "growing days" in 1986, the

shortest annual total recorded to date (Fig. 2). A reduction in the length of grass growing season is believed to have a generally depressant effect on sea trout numbers rather than a specific and immediate consequence in any year. The three year (to 1986) total is only slightly better than its equivalent to 1984 and is thus the second worst three year growing day total since records commenced in 1946.

Counts at Burrishoole

As in previous years, details of trout counted through the traps in Burrishoole were provided by Dr. D.J. Piggins of the Salmon Research Trust of Ireland. In 1986 these were:

Moving downstream	Spring descending smolts:	3432
	Autumn descending brown trout:	5803
Moving upstream	Sea run trout:	1384

These counts bear a close similarity to those recorded in 1985. Once again they are very low, in keeping with current climatic conditions and with the run in recent years. More precise conclusions are difficult. The Burrishoole records provide a unique account of trout production from and of sea-run fish to freshwater. A number of combinations of these data have been inter-correlated and the figures have been correlated against climatic variables to explain the mechanism regulating sea trout populations.

The most persuasive, described in earlier publications, is growing season and the latest data support the theory. Numbers of trout leaving freshwater per calendar year (i.e. the smolts and autumn descending brownies in year x) correlate highly significantly with the number of growing days per three years, to year x inclusive ($r = 0.9687$ d.f.15 $P < 0.001$).

A second relationship between the numbers of trout leaving freshwater (as smolts in year x plus autumn descending brownies in year x-1) correlates significantly with sea-run trout returning in year x ($r = 0.6501$ d.f.= 14 $P < 0.01$).

Further analyses have not been rewarded with significant findings.

Within the juvenile trout population there are a variety of ways in which the individual fish can respond to environmental circumstances. Density interacts with growth rate. The fish may abandon or be driven out of freshwater at a small size in the autumn of the year - or it may migrate to sea as a smolt in the spring - in which phase its chances of surviving to return are increased. The relationships

which have been established are vague but they are probably the most that could be expected without more detailed information on the catchment in question.

The Waterville collection

The Currane fishery was sampled in 1986 by Neill Horton of Dundalk RTC. All salmonids from the fishery were examined in the standard way and 172 were, on scale examination, found to be sea run trout.

The average weight of the sample was 550g, suggesting a large proportion of fish of one sea winter and older. An age analysis of the trout confirmed this: 64% were post-smolt, a reduction of 14% from the previous year. The percentage of one sea winter trout doubled in the interim, a development which is interpreted as signifying a lower recruitment in 1986.

The most obvious explanation for poor recruitment is the low temperatures of the spring months and further evidence was sought in the collection to clarify the situation. The mean smolt age of post-smolts in 1986 was 2.25 years, the lowest in the seven years during which the Waterville census has taken place. The association of high mean smolt age with short growing season has been proposed but it is a relationship which could be modified by the density of juveniles in freshwater. In other words, a low mean smolt age in current growing conditions would support the contention that numbers of trout running to sea were reduced. A B type increment - indicating freshwater growth in the year of first descent to sea occurred on the scales of 52% of two year smolts, a figure which has been fairly constant in Waterville (with extremes of 71% in 1981 and 30% in 1984) but the actual growth made in post-smolts of that age averaged 2.7cm, a figure almost identical with that of 1984.

Freshwater growth rates are largely similar to those of other years but there were some minor differences whose significance is not known. All smolts migrating in 1986 were larger in size, some by as much as 1cm fork length, than their equivalent age groups in any of the previous six sampling years. An explanation for this phenomenon remains to be found; while average length at a particular age in sea trout tends to be fairly uniform, the occasional anomaly might be a significant indicator of stressful environmental conditions.

The Waterville investigations have now been discontinued and a detailed account of them is in preparation.

ACKNOWLEDGEMENT

Sincere thanks are offered to my colleague Patrick McDaid of the Fisheries Research Centre for his invaluable assistance with processing these results by computer.

Reports and papers recently available

Fahy, E (1986) The sea trout year 1985 Fishery Leaflet No. 134: 20pp. The predecessor of this leaflet; reviews stocks and catches in the previous year.

Fahy, E. J.J. Nixon, M. Murphy and S. Dempster (1984). Salmonid carrying capacity of streams in the Connemara region, a resource appraisal. Fisheries Bulletin No. 9: 28pp. Assesses standing crops of juvenile salmonids in Connemara, based on a survey of 80 streams over a 12 month period.

Fahy, E (1986). Fish kills in 1985 Fishery Leaflet No. 132: 7pp. A total of 37 fish kills are evaluated in similar terms to 200 incidents logged in 1983 and 1984 (Fishery Leaflet No. 128). High water levels in 1985 are believed to be the main factor mitigating the consequences of pollution.

Fahy, E (1986) Capture of sea-trout by illegal means in the Western Fisheries Region. Some observations for discussion. Fishery Leaflet No. 130: 8pp. Examines gear in use and provides observations on the likely sea trout catch in the context of what is known of the stocks. Concludes that most of the illegal fishing effort is directed at salmon.

Fahy, E (1986). The shrinking salmon The Atlantic Salmon Journal 36 (2): 11-12. Examines possible explanations for changes in salmon populations as a result of climatic influence at sea.

Fahy, E (1986). Dynamics of dinotrutta. Salmon and Trout Magazine 232:63-65. Reviews the characteristics of ferox trout and concludes that the term, once in general use describing large trout, now has a more specific meaning. The majority of Irish trout so described do not belong to this taxon.

Fahy, E (1986). Tip of the Iceberg; Fish kills in Ireland. Irish Journal of Environmental Science 3 (2): 31-33. Another

presentation of information on fish kills contained in Fishery Leaflet No. 128.

Fahy, E (1986) Yarns and oracles Salmon and Trout Magazine 231: 68-71. An appraisal of the Delphi Fishery in Co. Mayo.

Fahy, E (1987). Profile of the Caragh: a salmonid producing catchment. Fishery Leaflet No. 136 19pp. The Caragh has for long been regarded as a salmon rather than a sea trout producer. The work described in this leaflet consists of an examination of the topography of the catchment plus field observations on the densities of juvenile salmonids. Comparison is made with the Ballinahinch catchment in Connemara. The mountainous terrain of the Caragh provides conditions which favour Atlantic salmon, strong juvenile densities of which occur there.

Table 1 Estimates by Fishery Board staff of sea trout catches in 1985 and 1986. The totals are for districts reported in the two years

Fishery District	1985	1986	% Change
Drogheda	1 720	846	-50.8
Dublin	3 811	4 138	+ 8.6
Wexford	2 079	187	-91.0
Waterford		504	
Lismore		147	
Cork		355	
Kerry		716	
Limerick		166	
Galway	423	250	
Connemara	13 209	9 755	-26.1
Ballinakill	7 757	3 955	-49.0
Bangor	2 413	3 896	+61.5
Ballina	205		
Sligo	136	155	+14.0
Totals	31 548	23 183	-26.5

Table 2: Details of licensed rod fishing effort and sea trout catch in 1985 and 1986 from 610 licence returns from 1985 and 795 from the 1986 season.

	Ratio of sea trout fishing days to salmon fishing days		Mean weight (lb) of individual sea trout caught		Average wt. (lb) of sea trout caught per rod day	
	1985	1986	1985	1986	1985	1986
Dublin	0.18	0.51	1.19	0.98	0.34	0.17
Wexford	0.50	0.64	0.83	1.10	0.49	0.27
Waterford	0.08	0.01	0.90	2.38	0.25	0.99
Lismore	0.44	0.08	0.86	1.01	0.24	0.57
Cork	0.30	0.32	1.27	1.12	0.51	0.36
Kerry	1.45	1.14	1.30	1.16	1.40	1.16
(Currane)	5.27	3.63	1.33	1.35	1.96	1.43
Limerick	0.32	0.09	0.84	1.15	0.43	0.69
Galway	0.48	0.71	0.77	0.89	0.99	0.30
Connemara	2.12	3.47	1.16	0.90	3.06	1.76
Ballinakill	1.50	0.94	0.85	1.00	2.03	1.17
Bangor	0.90	0.81	0.85	0.96	1.70	1.81
Ballina	0.16	0.21	0.94	1.08	0.36	0.24
Sligo	0.65	0.41	1.98	1.70	0.25	0.19
Ballyshannon	0.46	0.50	0.96	0.85	0.58	0.17
Letterkenny	0.99	0.64	0.87	0.84	1.81	0.56
Dundalk	0.73	1.43	1.06	0.99	0.47	0.64
Drogheda	0.79	0.18	0.85	1.34	1.53	0.60
Averages from national totals	0.43	0.37	0.97	1.01	1.21	0.70

Table 3: Characteristics of the salmonid catch reported from four categories of rod licence from the 1986 season. Similar readings from 1985 are in brackets.

	A		B		R		P	
Sea trout								
Number	(8.7)	5.9	(10.6)	3.9	(1.7)	0.8	(10.1)	5.1
Weight(lb)	(8.9)	6.0	(10.6)	3.8	(1.8)	0.8	(8.3)	5.4
Days fishing	(7.4)	8.6	(9.2)	7.2	(1.4)	0.9	(6.4)	5.6
Salmon								
Number	(4.5)	5.3	(3.2)	3.3	(1.1)	1.5	(1.1)	1.8
Weight(lb)	(31.4)	36.8	(20.9)	24.2	(6.8)	11.7	(7.1)	10.7
Days fishing	(19.1)	25.0	(24.7)	22.6	(2.8)	5.0	(4.3)	5.8
Licences returned	(161)	194	(247)	286	(70)	125	(104)	146

Categories of licence

A,	Annual, all districts	£17.00
B,	Annual, one district	£8.00
R,	Seven day,all districts	£6.00
P,	Late season, one district	£6.00

Table 4 Returns from drift and draft licences for the years 1981 to 1986 inclusive.

	1981	1982	1983	1984	1985	1986
DRIFT NETS						
Weight of salmon per licence(lb)	1015	566	1340	581	1436	1373
Number of salmon per licence	377	83	185	92	210	201
Mean weight individual salmon	6.91	6.78	7.24	6.32	6.84	6.83
Weight of sea trout per licence (lb)	5.5	5.3	26.0	33.6	7.7	7.5
Number of sea trout per licence	2.0	1.6	8.4	10.2	2.1	2.0
Sea trout as % weight of salmon	0.54	0.94	1.9	5.8	0.01	0.01
Mean weight individual sea trout (lb)	2.72	3.36	3.08	3.38	3.65	3.70
Number of licences returned	230	138	57	123	146	64
DRAFT NETS						
Weight of salmon per licence (lb)	567	362	601	399	475	571
Number of salmon per licence	76	54	92	60	68	80
Mean weight individual salmon (lb)	7.42	6.74	6.55	6.63	6.97	7.2
Weight of sea trout per licence (lb)	23.9	40.1	107.6	108.4	99.9	22.9
Number of sea trout per licence	13	26	74	56	48	20.0
Sea trout as % weight salmon	4.2	11.1	17.9	27.2	21.0	0.04
Mean weight individual sea trout (lb)	1.80	1.55	1.45	1.95	2.07	1.16
Number of licences returned	185	222	101	129	110	43

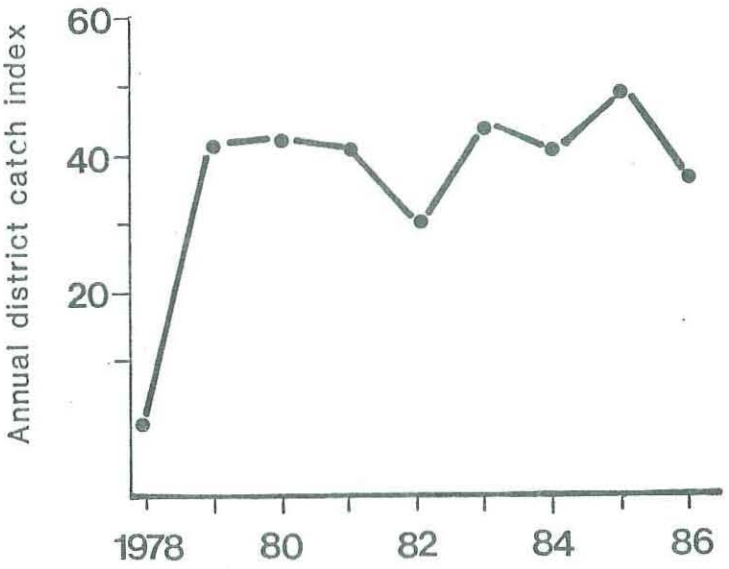

Figure 1 Variation in an index of sea trout catches as reported by district inspectors, 1978-1986

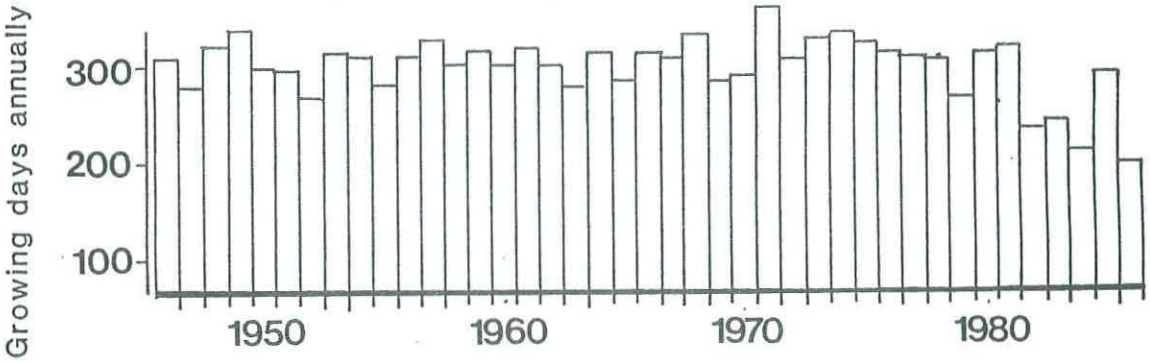

Figure 2 Variation in the annual "growing season" 1946-1986